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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.

HM32/1027

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EXAMINER	

ART UNIT	PAPER NUMBER

DATE MAILED: 05/27/99

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary	Application No. 08/828,323	Applicant(s) O'Donnell
	Examiner Einar Stole	Group Art Unit 1653

☒ Responsive to communication(s) filed on *Jun 8, 1999* .

☒ This action is **FINAL.**

☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire *3* month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

☒ Claim(s) *5-8, 10, 12-17, 19, 20, 54, 55, 57-60, 62, 64, and 65* is/are pending in the application.

Of the above, claim(s) _____ is/are withdrawn from consideration.

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) *5-7, 12-16, 19, 20, 54, 55, 57-60, 64, and 65* is/are rejected.

☒ Claim(s) *8, 10, 17, and 62* is/are objected to.

☐ Claims _____ are subject to restriction or election requirement.

Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on _____ is ☐approved ☐disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been

☐ received.

☐ received in Application No. (Series Code/Serial Number) _____ .

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____ .

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☐ Notice of References Cited, PTO-892

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

DETAILED ACTION

1. Claims 9, 11, 18, 21-53, 56, 61, 63, and 66-75 has been canceled by the Amendment of June 8, 1999 (Paper No. 15). Claims 5-8, 10, 12-17, 19, 20, 54, 55, 57-60, 62, 64, and 65 are still pending.

Specification

2. Applicant has canceled the new matter presented by amendment of the specification at page 17 by the Amendment of August 5, 1997 (Paper No. 12). In addition, Applicant's submission of a substitute paper copy, CRF and a statement that the content of the paper and computer readable copies are the same and, where applicable, include no new matter, as required by 37 C.F.R. 1.821(e) or 1.821(f) or 1.821(g) or 1.825(b) or 1.825(d).

Terminal Disclaimer

3. The terminal disclaimer filed on June 8, 1999 (Paper No. 17), disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of US Patent 5,668,004, has been reviewed and is accepted. The terminal disclaimer has been recorded.

Claim Objections

4. Claims 8, 10, 17, and 62 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claims 19 and 20 stand rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

This rejection is explained in the previous Office action. Applicant's Declaration under 37 CFR 1.132, filed June 8, 1999 (Paper No. 16) does not overcome the rejection of claims 19 and 20, under 35 USC 112, first paragraph, because the Declaration relies on teachings published after the filing date of the application. The state of the art existing at the filing date of the application is used to determine whether a particular disclosure is enabling as of the filing date. Publications dated after the filing date providing information publicly first disclosed after the filing date generally cannot be used to show what was known at the time of filing. *In re Gunn*, 537 F.2d 1123, 190 USPQ 402 (CCPA 1976). A later dated publication, although it cannot supplement an insufficient disclosure in a prior dated application to make it enabling, can, however, offer the later dated publication as evidence of the level of skill in the art at the time the invention was filed when submitted as testimony of an expert, as is the case here. *Gould v. Quigg*, 822 F.2d 1074, 3 USPQ2d 1302 (Fed. Cir. 1987); see also MPEP 2164.05(a). The information provided by the later published documents is directed to the relatedness and specific sequences of the δ and δ' subunits of eubacterial DNA polymerase III.

The rejection of claims 19 and 20, under 35 USC 112, first paragraph, is directed to the non-enablement of the instant specification for subunits of DNA polymerase III holoenzyme for polypeptides of any sequence or structure and is based on the unpredictability of the art with regard to structure function relationships and the lack of guidance provided by the prior art. Thus, reference to the later published documents to overcome the rejection of claims 19 and 20, under 35 USC 112, first paragraph, relies on the ability of these references to supplement an insufficient disclosure by the instant application.

7. Claims 5-7, 12, 13, 59, 64, and 65 stand rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

This rejection is explained in the previous Office action. Applicant's Declaration under 37 CFR 1.132, filed June 8, 1999 (Paper No. 16) does not overcome the rejection of claims 5-7, 12, 13, 59, 64, and 65, under 35 U.S.C. 112, first paragraph, because the Declaration relies on teachings published after the filing date of the application. Claims 5-7, 12, 13, 59, 64, and 65 drawn to a genus of nucleic acids encoding δ and δ' subunits of DNA polymerase III from eubacterial sources. The instant claims and specification do not specifically define, in structural terms, any of the claimed nucleic acids from any other source than *Escherichia coli*. Thus, while the instant claims are directed to a genus of DNA molecules encoding DNA polymerase III subunits, the specification fails to provide any representative species of such subunits. Moreover, the specification fails to describe any

representative species by any identifying characteristics or properties other than the functionality of the subunit encoded by the claimed DNA molecules. Given this lack of representative DNA species, Applicant has failed to sufficiently described the claimed invention in such full, clear, concise, and exact terms that a skilled artisan would recognize that Applicant was in possession of the claimed invention. Although the predictability of the art is a factor considered in the analysis of a claim drawn to a genus of nucleic acids, this determination must be made at the time the invention was made. Thus, Applicant's Declaration under 37 CFR 1.132, filed June 8, 1999 (Paper No. 16) does not overcome the rejection of claims 5-7, 12, 13, 59, 64, and 65 stand rejected under 35 U.S.C. 112, first paragraph, because the Declaration relies on teachings published after the filing date of the application and does not demonstrate a predictable art at the time the invention was made.

8. Claims 14-16, 54, and 57 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

This rejection is explained in the previous Office action. Applicant's Declaration under 37 CFR 1.132, filed June 8, 1999 (Paper No. 16) does not overcome the rejection of claims 14-16, 54, and 57, under 35 U.S.C. 112, first paragraph, because the Declaration relies on teachings published after the filing date of the application. Claims 14-16, 54, and 57 drawn to a genus of δ and δ' subunits of DNA polymerase III from eubacterial sources. The instant claims and specification do not specifically define, in structural terms, any of the claimed subunits from any other source than

Escherichia coli. Thus, while the instant claims are directed to a genus of DNA polymerase III subunits, the specification fails to provide any representative species of such subunits. Moreover, the specification fails to describe any representative species by any identifying characteristics or properties other than the functionality of the subunit encoded by the claimed molecules. Given this lack of representative species, Applicant has failed to sufficiently describe the claimed invention in such full, clear, concise, and exact terms that a skilled artisan would recognize that Applicant was in possession of the claimed invention. Although the predictability of the art is a factor considered in the analysis of a claim drawn to a genus of subunits, this determination must be made at the time the invention was made. Thus, Applicant's Declaration under 37 CFR 1.132, filed June 8, 1999 (Paper No. 16) does not overcome the rejection of claims 14-16, 54, and 57 stand rejected under 35 U.S.C. 112, first paragraph, because the Declaration relies on teachings published after the filing date of the application and does not demonstrate a predictable art at the time the invention was made.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless --(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. Claims 59, 60, 64 and 65 stand rejected under 35 U.S.C. 102(b) as being anticipated by Takase et al. Claims 59, 60, 64 and 65 are drawn to the DNA molecules encoding the isolated, segregated δ subunit of the DNA polymerase III from *Escherichia coli.*

Takase et al. teach the *Escherichia coli rlpA* gene, which encodes a 36 kDa protein, its isolation and expression. Applicant's arguments, filed on June 8, 1999 as Paper No. 15, which reiterate the discussion of the prior art teachings of Takase et al. present in the Declaration under 37 CFR 1.132, filed on December 17, 1996 in the parent application, 08/279,058, and resubmitted here as Paper No. 16, have been fully considered but they are not persuasive. The claimed sequence, the 1032 nucleotides of SEQ ID NO: 6, were compared with sequences of the prior art using MPSearch sequence analysis software employing the Smith-Waterman algorithm and using the default Table and a gap penalty of 6. The claimed DNA molecule, corresponding to SEQ ID NO: 6 and the nucleic acids encoding the protein described by SEQ ID NO: 9, is 100% identical to the nucleotide sequence taught by Takase et al. The Declaration under 37 CFR 1.132 filed on December 17, 1996 in the parent application, 08/279,058, and resubmitted here as Paper No. 16, is insufficient to overcome the rejection of claims 59, 60, 64 and 65 based upon Takase et al. as applied under 35 USC § 102(b) as set forth in the last Office action, because the Declaration fails to set forth facts supporting the conclusions presented in the Declaration. Applicant asserts that the sequences disclosed by the instant application are not identical to the nucleotide sequence taught by Takase et al. The Applicant cites references which support the assertion that the nucleotide sequence taught by Takase et al. is erroneous. Regardless of the accuracy of the reported sequences, sequence analysis of the nucleotide

sequences disclosed by Takase et al. show that a sequence taught by Takase et al. is 100% identical to the nucleotide sequence described by SEQ ID NO: 6. Furthermore, the references relied upon by the Applicant in the Declaration do not qualify as prior art. Thus, the teachings of these references are not available to demonstrate the state of the art at the time the invention was made. Therefore, the Declaration of December 17, 1996, with regard to the prior art teachings of Takase et al. does not present facts sufficient to overcome the rejection of claims 59, 60, 64 and 65 based upon Takase et al. as applied under 35 USC § 102(b).

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

12. Claims 54, 55, 57-60, 64 and 65 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Takase et al. Claims 54, 55, 57 and 58 are drawn to the isolated, segregated δ subunit of the DNA polymerase III from *Escherichia coli*. Claims 64 and 65 are drawn to the expression of the δ subunit of the DNA polymerase III from *Escherichia coli* and host cells transformed with nucleic acids encoding the δ subunit of the DNA polymerase III.

Takase et al. teach the *Escherichia coli rlpA* gene, which encodes a 36 kDa protein, its isolation and expression. The claimed nucleotide sequence, the 1032 nucleotides described by SEQ ID NO: 6, were compared with sequences of the prior art using MPSearch sequence analysis software employing the Smith-Waterman algorithm and using the default Table and a gap penalty of 6. The DNA molecules encoding the δ subunit of DNA polymerase III disclosed in the instant application, which corresponds to SEQ ID NO: 6 , is identical to the nucleotide sequence taught by Takase et al. It would have been obvious to one of ordinary skill in the art at the time the invention was made to express the nucleic acids taught by Takase et al., because techniques for the expression of isolated genes were well known in the art at the time the invention was made, and the skilled artisan would have been motivated to isolate the expressed gene product.

Conclusion

13. No claims are allowable. Claims 8, 10, 17, and 62 are allowable over the prior art of record.

14. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

15. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be

calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

16. The Group and Art Unit location of your application in the PTO has changed. To aid in correlating any papers for this application, all further correspondence regarding this application should be directed to Group Art Unit 1653.

17. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Einar Stole, Ph.D., whose telephone number is (703) -305-4507. The Examiner can normally be reached Tuesday through Friday 6:30 a.m. to 5:00 p.m.

If attempts to reach the Examiner are unsuccessful, the Examiner's supervisor, Bradley Sisson, can be reached on (703)-308-3978. The fax phone number for Technology Center 1600 is (703)-305-7401.

Any inquiry of a general nature or relating to the status of this application should be directed to the Technology Center 1600 receptionist whose telephone number is (703)-308-0196.

August 26, 1999

B. L. Sisson

BRADLEY SISSON
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1600
8/26/99

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Qy     361 CAAGAAAATGCCGCCTGGTTTACTGCGCTTGCGAATCGCAGCGTGCAGGTGACCTGTCAG 420

Db     475 ACACCGGAGCAGGCTCAGCTTCCCCGCTGGGTTGCTGCGCGCGCAAAACAGCTCAACTTA 534
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Db     535 GAACTGGATGACGCGGCAAATCAGGTGCTCTGCTACTGTTATGAAGGTAACCTGCTGGCG 594
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Db     655 CGCGTTGAACAGGCGGTGAATGATGCCGCGCATTTCACCCCTTTTCATTGGGTTGATGCT 714
           ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Qy     601 CGCGTTGAACAGGCGGTGAATGATGCCGCGCATTTCACCCCTTTTCATTGGGTTGATGCT 660

Db     715 TTGTTGATGGGAAAAAGTAAGCGCGCATTGCATATTCTTCAGCAACTGCGTCTGGAAGGC 774
           ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Qy     661 TTGTTGATGGGAAAAAGTAAGCGCGCATTGCATATTCTTCAGCAACTGCGTCTGGAAGGC 720

Db     775 AGCGAACCGGTTATTTTGTTGCGCACATTACAACGTGAACTGTTGTTACTGGTTAACCTG 834
           ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Qy     721 AGCGAACCGGTTATTTTGTTGCGCACATTACAACGTGAACTGTTGTTACTGGTTAACCTG 780

Db     835 AAACGCCAGTCTGCCCATACGCCACTGCGTGCGTTGTTTGATAAGCATCGGGTATGGCAG 894
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Qy     781 AAACGCCAGTCTGCCCATACGCCACTGCGTGCGTTGTTTGATAAGCATCGGGTATGGCAG 840

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Db    1075 ATCGACGGTTGA 1086
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Qy    1021 ATCGACGGTTGA 1032
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RESULT    3
LOCUS       ECODELTA     1261 bp    DNA              BCT       23-JUL-1993
DEFINITION  Escherichia coli (clone pUC-delta) DNA polymerase III delta subunit
            (holA) gene, complete cds.
ACCESSION   L04576
NID         g145728
KEYWORDS    DNA polymerase III delta subunit; holA gene.
SOURCE      Escherichia coli (strain K-12) (library: lamda-phage of Y. Kohara)
            DNA.
  ORGANISM  Escherichia coli
            Eubacteria; Proteobacteria; gamma subdivision; Enterobacteriaceae;
            Escherichia.
REFERENCE   1  (sites)
  AUTHORS   Takase,I., Ishino,F., Wachi,M., Kamata,H., Doi,M., Asoh,S.,
            Matsuzawa,H., Ohta,T. and Matsuhashi,M.
  TITLE     Genes encoding two lipoproteins in the leuS-dacA region of the
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  JOURNAL   J. Bacteriol. 169, 5692-5699 (1987)
  MEDLINE   88058785
REFERENCE   2  (bases 1 to 1261)
  AUTHORS   Dong,Z., Onrust,R., Skangalis,M. and O'Donnell,M.
  TITLE     DNA polymerase III accessory proteins. I. holA and holB encoding
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  JOURNAL   J. Biol. Chem. 268, 11758-11765 (1993)
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                     ELDDAANQVLCYCYEGNLLALAQALERLSLLWPDGKLTLPRVEQAVNDAAHFTPFHWV
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ORIGIN
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Qy       1 ATGATTCGGTTGTACCCGGAACAACTCCGCGCGCAGCTCAATGAAGGGCTGCGCGCGGCG 60

Db     188 TATCTTTTACTTGGTAACGATCCTCTGTTATTGCAGGAAAGCCAGGACGCTGTTCGTCAG 247
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Qy      61 TATCTTTTACTTGGTAACGATCCTCTGTTATTGCAGGAAAGCCAGGACGCTGTTCGTCAG 120

Db     248 GTAGCTGCGGCACAAGGATTCGAAGAACACCACACTTTTTCCATTGATCCCAACACTGAC 307
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Qy     121 GTAGCTGCGGCACAAGGATTCGAAGAACACCACACTTTTTCCATTGATCCCAACACTGAC 180

Db     308 TGGAATGCGATCTTTTCGTTATGCCAGGCTATGAGTCTGTTTGCCAGTCGACAAACGCTA 367
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Db     488 CAAGAAAATGCCGCCTGGTTTACTGCGCTTGCGAATCGCAGCGTGCAGGTGACCTGTCAG 547
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Qy     361 CAAGAAAATGCCGCCTGGTTTACTGCGCTTGCGAATCGCAGCGTGCAGGTGACCTGTCAG 420

Db     548 ACACCGGAGCAGGCTCAGCTTCCCCGCTGGGTTGCTGCGCGCGCAAAACAGCTCAACTTA 607
           ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Qy     421 ACACCGGAGCAGGCTCAGCTTCCCCGCTGGGTTGCTGCGCGCGCAAAACAGCTCAACTTA 480

Db     608 GAACTGGATGACGCGGCAAATCAGGTGCTCTGCTACTGTTATGAAGGTAACCTGCTGGCG 667
           ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Qy     481 GAACTGGATGACGCGGCAAATCAGGTGCTCTGCTACTGTTATGAAGGTAACCTGCTGGCG 540

Db     668 CTGGCTCAGGCACTGGAGCGTTTATCGCTGCTCTGGCCAGACGGCAAATTGACATTACCG 727
           ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Qy     541 CTGGCTCAGGCACTGGAGCGTTTATCGCTGCTCTGGCCAGACGGCAAATTGACATTACCG 600

Db     728 CGCGTTGAACAGGCGGTGAATGATGCCGCGCATTTCACCCCTTTTCATTGGGTTGATGCT 787
           ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Qy     601 CGCGTTGAACAGGCGGTGAATGATGCCGCGCATTTCACCCCTTTTCATTGGGTTGATGCT 660

Db     788 TTGTTGATGGGAAAAAGTAAGCGCGCATTGCATATTCTTCAGCAACTGCGTCTGGAAGGC 847
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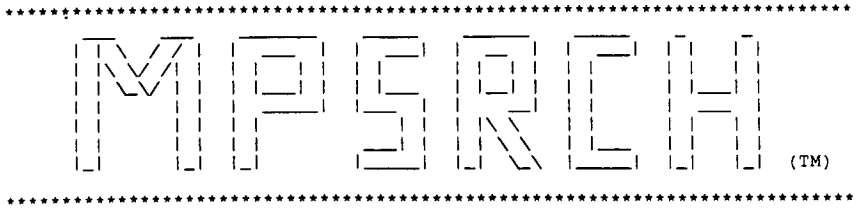

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Statistics: Mean 10.628; Variance 4.330; scale 2.455

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

SUMMARIES

	Result No.	Score	% Query Match	Length	DB	ID	Description	Pred. No.
	1	1032	100.0	1032	17	I65512	Sequence 6 from patent	0.00e+00
	2	1032	100.0	1147	12	ECODNAPDS	E. coli DNA polymerase	0.00e+00
	3	1032	100.0	1261	12	ECODELTA	Escherichia coli (clon	0.00e+00
c	4	1032	100.0	12663	12	ECAE000168	Escherichia coli K-12	0.00e+00
c	5	1032	100.0	18657	12	D90704	Escherichia coli genom	0.00e+00
c	6	1032	100.0	136742	12	ECU82598	Escherichia coli genom	0.00e+00
	7	195	18.9	938	12	ECORLPB	E.coli rlpB gene encod	1.28e-160
	8	57	5.5	10568	12	U32774	Haemophilus influenzae	7.66e-27
c	9	40	3.9	216021	21	HUAC004787	Homo sapiens Chromosom	1.55e-12
c	10	35	3.4	74371	21	AC005369	Homo sapiens chromosom	1.22e-08
	11	31	3.0	215	17	I28278	Sequence 5 from patent	1.12e-05
c	12	30	2.9	7218	17	I66494	Sequence 14 from paten	5.83e-05
	13	30	2.9	74371	21	AC005369	Homo sapiens chromosom	5.83e-05
c	14	29	2.8	215	17	I28278	Sequence 5 from patent	2.95e-04
	15	27	2.6	7218	17	I66494	Sequence 14 from paten	6.92e-03
	16	25	2.4	565	17	E04076	gDNA encoding envelope	1.43e-01
	17	25	2.4	216021	21	HUAC004787	Homo sapiens Chromosom	1.43e-01
c	18	24	2.3	354	14	OFU89259	Oxytricha fallax 57kD	6.12e-01
c	19	24	2.3	565	17	E04076	gDNA encoding envelope	6.12e-01
	20	24	2.3	2971	12	LMU15554	Listeria monocytogenes	6.12e-01
	21	24	2.3	4409	22	AF008439	Rattus norvegicus natu	6.12e-01
c	22	23	2.2	1205	21	AF038192	Homo sapiens clone 238	2.52e+00
	23	23	2.2	2478	9	A63310	Sequence 3 from Patent	2.52e+00
	24	23	2.2	10772	14	AF012089	Drosophila melanogaste	2.52e+00
c	25	23	2.2	37675	14	CELM01G5	Caenorhabditis elegans	2.52e+00
	26	23	2.2	91149	19	AF058919	Arabidopsis thaliana B	2.52e+00
	27	23	2.2	239566	21	HSAJ03147	Homo sapiens complete	2.52e+00
c	28	22	2.1	69	17	I20505	Sequence 29 from paten	9.96e+00
	29	22	2.1	186	17	E01875	DNA encoding peptide w	9.96e+00
	30	22	2.1	219	17	I06471	Sequence 8 from Patent	9.96e+00
	31	22	2.1	222	17	I90073	Sequence 4 from patent	9.96e+00
	32	22	2.1	354	14	OFU89259	Oxytricha fallax 57kD	9.96e+00
c	33	22	2.1	1124	12	MBARGF	M.bovis ArgF gene for	9.96e+00
c	34	22	2.1	1707	22	RATINVO	Rattus norvegicus invo	9.96e+00
	35	22	2.1	2361	16	PEFMUR	Perca fluviatilis gene	9.96e+00
c	36	22	2.1	3660	21	AC002172	Homo sapiens (subclone	9.96e+00
	37	22	2.1	4503	21	HSCPSIMUT	Homo sapiens mRNA for	9.96e+00
	38	22	2.1	5215	17	E04065	cDNA encoding human ca	9.96e+00
	39	22	2.1	5215	21	HUMCPSI	Human carbamyl phospha	9.96e+00
c	40	22	2.1	17425	14	CET05F1B	Caenorhabditis elegans	9.96e+00
c	41	22	2.1	38000	12	MTCY06H11	Mycobacterium tubercul	9.96e+00
c	42	22	2.1	95912	21	AC003662	Homo sapiens chromosom	9.96e+00
	43	22	2.1	112726	13	CEY21F11	Caenorhabditis elegans	9.96e+00
c	44	22	2.1	135352	13	HS354J5	Human DNA sequence ***	9.96e+00
c	45	22	2.1	190289	27	MCU60315	Molluscum contagiosum	9.96e+00

ALIGNMENTS

RESULT 1
LOCUS I65512 1032 bp DNA PAT 26-SEP-1997
DEFINITION Sequence 6 from patent US 5668004.
ACCESSION I65512
NID g2482082
KEYWORDS .
SOURCE Unknown.
ORGANISM Unknown.
Unclassified.
REFERENCE 1 (bases 1 to 1032)
AUTHORS O'Donnell,M.E.
TITLE DNA polymerase III holoenzyme from Escherichia coli
JOURNAL Patent: US 5668004-A 6 16-SEP-1997;
FEATURES Location/Qualifiers
source 1. .1032
/organism="unknown"
BASE COUNT 241 a 262 c 278 g 251 t
ORIGIN

Query Match 100.0%; Score 1032; DB 17; Length 1032;
Best Local Similarity 100.0%; Pred. No. 0.00e+00;
Matches 1032; Conservative 0; Mismatches 0; Indels 0; Gaps 0;

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Qy       1 ATGATTCGGTTGTACCCGGAACAACTCCGCGCGCAGCTCAATGAAGGGCTGCGCGCGGCG 60

Db      61 TATCTTTTACTTGGTAACGATCCTCTGTTATTGCAGGAAAGCCAGGACGCTGTTCGTCAG 120
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Qy      61 TATCTTTTACTTGGTAACGATCCTCTGTTATTGCAGGAAAGCCAGGACGCTGTTCGTCAG 120

Db     121 GTAGCTGCGGCACAAGGATTCGAAGAACACCACACTTTTTCCATTGATCCCAACACTGAC 180
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Qy     121 GTAGCTGCGGCACAAGGATTCGAAGAACACCACACTTTTTCCATTGATCCCAACACTGAC 180

Db     181 TGGAATGCGATCTTTTCGTTATGCCAGGCTATGAGTCTGTTTGCCAGTCGACAAACGCTA 240
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Qy     181 TGGAATGCGATCTTTTCGTTATGCCAGGCTATGAGTCTGTTTGCCAGTCGACAAACGCTA 240
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Db     241 TTGCTGTTGTTACCAGAAAACGGACCGAATGCGGCGATCAATGAGCAACTTCTCACACTC 300
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Qy     241 TTGCTGTTGTTACCAGAAAACGGACCGAATGCGGCGATCAATGAGCAACTTCTCACACTC 300

Db     301 ACCGGACTTCTGCATGACGACCTGCTGTTGATCGTCCGCGGTAATAAATTAAGCAAAGCG 360
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Qy     301 ACCGGACTTCTGCATGACGACCTGCTGTTGATCGTCCGCGGTAATAAATTAAGCAAAGCG 360

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Qy     361 CAAGAAAATGCCGCCTGGTTTACTGCGCTTGCGAATCGCAGCGTGCAGGTGACCTGTCAG 420

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Db     661 TTGTTGATGGGAAAAAGTAAGCGCGCATTGCATATTCTTCAGCAACTGCGTCTGGAAGGC 720
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Qy     661 TTGTTGATGGGAAAAAGTAAGCGCGCATTGCATATTCTTCAGCAACTGCGTCTGGAAGGC 720

Db     721 AGCGAACCGGTTATTTTGTTGCGCACATTACAACGTGAACTGTTGTTACTGGTTAACCTG 780
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Qy     721 AGCGAACCGGTTATTTTGTTGCGCACATTACAACGTGAACTGTTGTTACTGGTTAACCTG 780

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Db     841 AACCGCCGGGGCATGATGGGCGAGGCGTTAAATCGCTTAAGTCAGACGCAGTTACGTCAG 900
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Qy     841 AACCGCCGGGGCATGATGGGCGAGGCGTTAAATCGCTTAAGTCAGACGCAGTTACGTCAG 900

Db     901 GCCGTGCAACTCCTGACACGAACGGAACTCACCCTCAAACAAGATTACGGTCAGTCAGTG 960
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Qy     901 GCCGTGCAACTCCTGACACGAACGGAACTCACCCTCAAACAAGATTACGGTCAGTCAGTG 960

Db     961 TGGGCAGAGCTGGAAGGGTTATCTCTTCTGTTGTGCCATAAACCCCTGGCGGACGTATTT 1020
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Db    1021 ATCGACGGTTGA 1032
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Qy    1021 ATCGACGGTTGA 1032
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RESULT    2
LOCUS       ECODNAPDS     1147 bp    DNA              BCT       21-DEC-1992
DEFINITION  E. coli DNA polymerase III delta subunit (holA) gene, complete cds.
ACCESSION   M94267
NID         g145784
KEYWORDS    DNA polymerase III delta subunit.
SOURCE      Escherichia coli (strain MAF102) DNA.
  ORGANISM  Escherichia coli
            Eubacteria; Proteobacteria; gamma subdivision; Enterobacteriaceae;
            Escherichia.
REFERENCE   1  (sites)
  AUTHORS   Takase,I., Ishino,F., Wachi,M., Kamata,H., Doi,M., Asoh,S.,
            Matsuzawa,H., Ohta,T. and Matsuhashi,M.
  TITLE     Genes encoding two lipoproteins in the leuS-dacA region of the
            Escherichia coli chromosome
  JOURNAL   J. Bacteriol. 169, 5692-5699 (1987)
  MEDLINE   88058785
REFERENCE   2  (bases 1 to 1147)
  AUTHORS   Carter,J.C., Franden,M.A., Aebersold,R.H. and McHenry,C.S.
  TITLE     Molecular cloning, sequencing, and overexpression of the structural
            gene encoding the delta subunit of Escherichia coli DNA polymerase
            III holoenzyme
  JOURNAL   J. Bacteriol. 174, 7013-7025 (1992)
  MEDLINE   93015766
FEATURES             Location/Qualifiers
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                     /db_xref="taxon:562"
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                     /evidence=experimental
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BASE COUNT      265 a    297 c    305 g    280 t
ORIGIN
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  Query Match          100.0%;  Score 1032;  DB 12;  Length 1147;
  Best Local Similarity 100.0%;  Pred. No. 0.00e+00;
  Matches  1032;  Conservative    0;  Mismatches   0;  Indels   0;  Gaps   0;

Db      55 ATGATTCGGTTGTACCCGGAACAACTCCGCGCGCAGCTCAATGAAGGGCTGCGCGCGGCG 114
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Qy       1 ATGATTCGGTTGTACCCGGAACAACTCCGCGCGCAGCTCAATGAAGGGCTGCGCGCGGCG 60

Db     115 TATCTTTTACTTGGTAACGATCCTCTGTTATTGCAGGAAAGCCAGGACGCTGTTCGTCAG 174
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Qy      61 TATCTTTTACTTGGTAACGATCCTCTGTTATTGCAGGAAAGCCAGGACGCTGTTCGTCAG 120

Db     175 GTAGCTGCGGCACAAGGATTCGAAGAACACCACACTTTTTCCATTGATCCCAACACTGAC 234
           ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Qy     121 GTAGCTGCGGCACAAGGATTCGAAGAACACCACACTTTTTCCATTGATCCCAACACTGAC 180

Db     235 TGGAATGCGATCTTTTCGTTATGCCAGGCTATGAGTCTGTTTGCCAGTCGACAAACGCTA 294
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Qy     181 TGGAATGCGATCTTTTCGTTATGCCAGGCTATGAGTCTGTTTGCCAGTCGACAAACGCTA 240

Db     295 TTGCTGTTGTTACCAGAAAACGGACCGAATGCGGCGATCAATGAGCAACTTCTCACACTC 354
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Qy     241 TTGCTGTTGTTACCAGAAAACGGACCGAATGCGGCGATCAATGAGCAACTTCTCACACTC 300

Db     355 ACCGGACTTCTGCATGACGACCTGCTGTTGATCGTCCGCGGTAATAAATTAAGCAAAGCG 414
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Qy     301 ACCGGACTTCTGCATGACGACCTGCTGTTGATCGTCCGCGGTAATAAATTAAGCAAAGCG 360

Db     415 CAAGAAAATGCCGCCTGGTTTACTGCGCTTGCGAATCGCAGCGTGCAGGTGACCTGTCAG 474
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